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small fruit and grain." The same sweeping ignorance and prejudice characterizes her account of the crow, of which she says: "This is another bird that you may hunt from your woods, shoot (if you can) in the fields and destroy with poisoned grain. Here he has not a single good mark against his name. He is a cannibal, devouring both the eggs and young of insect-destroying song-birds." As a matter of fact, the eggs and young of wild birds and poultry together form less than one per cent. of the food of the crow, as determined by the examination of about a thousand stomachs in the U. S. Department of Agriculture. So with grain; sprouting corn forms only two per cent. of the entire food, most of the corn eaten by crows being waste grain picked up, chiefly in winter, in fields and other places where its consumption is no loss to the farmer. On the other hand, mice and other injurious mammals form  $1\frac{1}{2}$  per cent. of the food of crows; and insects no less than  $23\frac{1}{2}$  per cent.

The colored plates are execrable. Most of them are cheap, coarse, dauby caricatures, taken second-hand from Audubon, who would turn in his grave if he saw them. In addition to these, there are five uncolored process reproductions of water birds and birds of prey. The latter are from Dr. Fisher's *Hawks and Owls of the United States* (published by the U. S. Department of Agriculture) and, though poor, are by far the best illustrations in the book.

Excepting the plates, the book is neatly gotten up and well printed. A novel and useful feature is the insertion of the common name of the bird in heavy-face type at the top corner of the page, in the place usually occupied by the pagination.

On the whole, Mrs. Wright's *Birdcraft* may be recommended as a source of pleasure and assistance to the many lovers of nature who are trying to learn more about our common birds.

C. H. M.

*Anleitung zur Microchemischen Analyse*: Von H. BEHRENS, Professor an der Polytechnischen Schule in Delft. Mit 92 Figuren im Text. Hamburg, Leopold Voss. 1895. 224 pp.

Professor Behrens first wrote this book in French, and it was published in 1893. An English translation by Professor Judd appeared soon after. That the author published a German edition so soon speaks for the value of the book. Professor Behrens' text-book is the only one, as indeed he is the chief authority, on this new and important subject. The first half of the book describes the reactions of the elements, giving plates of the crystalline precipitates as seen through the microscope. Part Second treats of the systematic analysis of water, rocks, ores, alloys, and compounds of the rare elements. The chapter on the micro-chemical examination of rocks, by study of slides and of powdered rock is very interesting; indeed, for petrographic research the manual is invaluable, but it is also of great value to the metallurgist in the study of ores and alloys, and to the general chemist in the ordinary run of chemical analysis.

E. RENOUF.

#### NOTES AND NEWS.

##### THE AMERICAN ASSOCIATION.

THE preliminary announcement of the forty-fourth meeting of the American Association for the Advancement of Science, to be held in Springfield, Mass., August 28 to September 7, 1895, has now been issued. The arrangements promise an interesting and successful meeting.

The first general session will be held on the morning of Thursday the 29th. This will give Friday, Monday, Tuesday and Wednesday as the four days entirely devoted to the reading of papers in the sections. Saturday will be given to excursions in the vicinity of Springfield, and more dis-

tant excursions have been arranged to follow the close of the meeting.

At the first general session the President-elect, Prof. E. W. Morley, will be introduced by the retiring President, Prof. D. G. Brinton. Addresses of welcome will be made by his Honor, Mayor Chas. L. Long, and Hon. Wm. H. Haile, President of the Local Committee.

The addresses of the vice presidents before the sections are as follows:

W. LE CONTE STEVENS, before Section of Physics: *The Problem of Aerial Locomotion*.  
F. H. CUSHING, before Section of Anthropology.

JED. HOTCHKISS, before Section of Geology and Geography: *The Geological Survey of Virginia, 1835-1841. Its history and influence in the advancement of Geologic Science*.

B. E. FERNOW, before Section of Economic Science and Statistics: *The Providential Function of Government in relation to natural resources*.

McMURTIE, before Section of Chemistry.

J. C. ARTHUR, before Section of Botany: *The Development of Vegetable Physiology*.

WILLIAM KENT, before Section of Mechanical Science and Engineering.

In the evening the address of the retiring President, DR. DANIEL G. BRINTON, on *The Aims of Anthropology* will be given, followed by a reception by the Ladies' Reception Committee of Springfield.

The affiliated societies meeting in conjunction with the Association are:

*The Geological Society of America*; August 27 and 28. PROF. N. S. SHALER, Cambridge, President; PROF. H. L. FAIRCHILD, Rochester, Secretary.

*Society for Promotion of Agricultural Science*; August 26. PROF. WILLIAM SAUNDERS, Ottawa, President; PROF. WILLIAM FREAR, State College, Pa., Secretary.

*Association of Economic Entomologists*.

*Association of State Weather Service*. MAJ. H. H. C. DUNWOODY, Washington, President;

JAMES BERRY, Washington, Secretary.

*Society for Promoting Engineering Education*; September 2, 3, 4. GEO. F. SWAIN, Boston, President; PROF. J. B. JOHNSON, St. Louis, Secretary.

*American Chemical Society*; August 27 and 28. EDGAR F. SMITH, Philadelphia, President; PROF. ALBERT C. HALE, Brooklyn, Secretary.

*American Forestry Association*; September 3. HON. J. STERLING MORTON, Washington, President; F. H. NEWELL, Washington, Secretary.

The Botanical and Entomological Clubs of the Association will meet as usual during the Association week.

For information relating to membership and papers PROF. F. W. PUTNAM, Permanent Secretary, Salem, Mass., should be addressed. For all matters relating to local arrangements, hotels, railway rates and certificates, MR. W. A. WEBSTER, Local Secretary, A. A. A. S., Springfield, Mass., should be addressed.

#### THE BRITISH ASSOCIATION.

THE arrangements are now completed for the meeting of the British Association, to be held at Ipswich from September 11 to 19, under the presidency of Sir Douglas Galton. The following is the list of sectional presidents nominated by the Council: Section A (Mathematical and Physical Science), Professor W. M. Hicks, of Firth College, Sheffield; B (Chemistry), Professor R. Meldola, of the City and Guilds Technical College; C (Geology), Mr. W. Whitaker, of the Geological Survey; D (Zoölogy, including Animal Physiology), Professor W. A. Herdman, of Liverpool University College; E (Geography), Mr. H. J. Mackinder, Reader at Oxford; F (Economic Science and Statistics), Mr. L. L. Price, Bursar of Oriel College, Oxford; G (Mechanical Science), Professor L. F. Vernon Harcourt, of University College, London; H (Anthro-

pology), Professor W. M. Flinders Petrie, of University College, London; K (Botany), Mr. W. T. Thiselton-Dyer, Director of the Royal Botanic Gardens, Kew. The new President will deliver his inaugural address on September 11th. The two evening discourses will be given by Professor Silvanus Thompson, on 'Magnetism in Rotation,' and by Professor Percy F. Frankland, on 'The Work of Pasteur and its Various Developments.' There will be, as usual, two soirées, and also excursions to places of interest in the neighborhood of Ipswich.

#### MECHANICAL INTERPRETATION OF VARIATIONS OF LATITUDE.

UNDER this title, in No. 345 of the *Astronomical Journal*, Professor R. S. Woodward seeks to deduce the law of variations of latitudes from dynamical considerations. Starting with the hypothesis that the earth is a body of variable form, the general differential equations of rotation of such bodies are derived by means of the Lagrangian method. These equations are then shown to admit of considerable simplification when applied to the earth by reason of the fortunate circumstances that the variations of latitudes are very small, and that the principal moments of inertia of the earth vary exceedingly slowly. The integrals of the resulting equations give the rectangular coordinates of the instantaneous pole of the earth with respect to its pole of figure. The characteristic motion of the instantaneous pole is found to be the resultant of three distinct parts, namely, motion in a circle about the pole of figure with two series of elliptical motions superposed. This characteristic motion is subject, nevertheless, to some fluctuations arising from volcanic and similar impulsive disturbances, as well as from irregularities in meteorological processes.

The general features of latitude variations thus deduced from a purely theoretical basis

agree with those arrived at inductively by Dr. Chandler in his elaborate researches. Only one difficulty, in fact, seems to stand now in the way of a satisfactory accordance of theory and observation, and that is the prolongation of the period of the Eulerian cycle from 305 to 428 days. A considerable amount of space is devoted by the author to a discussion of this difficulty. He attacks the validity of the method of deriving the period of that cycle from the ratio furnished by precession, and concludes that the period so derived 'can no longer be maintained as a dogma of dynamical astronomy.' Of several causes which may modify this period, he considers the principal one to be the tide entailed by the motion of the instantaneous axis of rotation about the axis of figure. The order of magnitude of such a cause essential to account for the discrepancy is shown to be very small. The main object of the paper, however, is to obtain a correct specification of the analytical form of the variations in question, leaving to observation and subsequent investigation the determination and reconciliation of the constants which enter that form.

#### THE MISSOURI BOTANICAL GARDEN.

THE Sixth Annual Report of the Missouri Botanical Garden,\* issued on May 3rd, is an octavo volume of 134 pages, with 6 half-tone views taken in the Garden, and 56 plates illustrating plants described in the report.

The report of officers of the Board of Trustees shows that the receipts for the year 1894 were \$95,555.97, and the disbursements \$75,800.69, of which \$35,483.39 was spent on the maintenance and improvement of the Garden and the performance and publication of scientific work; \$3,692.29 was for banquets, exhibition premiums, a

\* *Missouri Botanical Garden*. Sixth Annual Report. St. Louis, Mo., Published by the Board of Trustees. 1895.

sermon on flowers, and other designated annual bequests of the founder of the Garden, the late Henry Shaw; \$21,334.85 went for taxes, and the remainder for office and other expenses incident to the administration of the trust. The report shows an invested or cash reserve of \$35,405.03.

From the report of the Director it appears that the herbarium was increased by the addition of 9,307 sheets of specimens, making a total of 231,527 sheets; and 752 books and 1,165 pamphlets were added to the library, making a total of 7,631 books and 9,822 pamphlets. Attention is called to the establishment of a 'Henry Shaw medal for the introduction of a valuable plant,' open to competition in any line of decorative horticulture at the annual flower show held in St. Louis, and to the provision now made for receiving additional pupils in gardening at the nominal charge of \$25 per year for tuition.

The scientific papers, which constitute the bulk of the volume, consist of a revision of North American species of *Sagittaria* and *Lophotocarpus*, by Jared G. Smith, with habit and detail illustrations of all of the species; a study of *Leitneria Floridana*, by William Trelease, illustrated by 15 plates showing the structure of this curious tree, the wood of which has a specific gravity of only 0.207, which is much lower than that of any other described wood, or even cork (0.240); studies of the dissemination and leaf reflexion of *Yucca aloifolia*, made in Florida, by Herbert J. Webber, and illustrated by three plates; notes and observations on new or little known species, by Jared G. Smith, accompanied by nine plates, and describing six new species from the Southwest; and notes on the interesting mound flora of Atchison county, Missouri, by B. F. Bush.

#### THE ROYAL ASTRONOMICAL SOCIETY.

At the last meeting much of the interest

of the evening centered in a comparison of two photographs of a well-known nebula—that near 15 Monocerotis—the one by the American astronomer, Professor E. E. Barnard, with a six-inch portrait lens, the other by Dr. Roberts, of Crowborough, with his 20-inch reflector. The exposures given and the ratio of aperture to size of image were practically the same in both cases. But the results were very different. Dr. Roberts' photograph showed a great amount of very delicate and beautiful detail in the nebula; Prof. Barnard's, when enlarged to the same scale, was of a much coarser character, but traced the nebula over a wider area. Dr. Roberts argued strongly against the reality of these faint extensions of the nebula shown in Professor Barnard's photograph, but the president showed, by a detailed comparison of the two photographs projected on the screen, that the contention was unfounded, and that the smaller instrument, though inferior to the larger for the exhibition of minute detail, had decidedly the advantage in the detection of faint nebulous masses. Another photograph by Dr. Roberts of the well-known crab nebula in Taurus also gave rise to some discussion, as it differed from the drawing made of the nebula by the late Lord Rosse in 1844. Mr. Chambers, however, pointed out that later visual observations had thrown doubt on the reality of some of the filaments shown in the sketch referred to. A paper from Professor Barnard gave a most convincing proof of variation having occurred in a nebula, that known as Hind's, in Taurus. Mr. Newall presented some recent observations of Phobos, the inner satellite of Mars, showing that the orbit of the satellite was distinctly elliptical, and the ephemeris some ten minutes in error. Mr. Stanley Williams contributed a very remarkable paper showing that spots in different longitudes of Saturn had different rotation periods. Mr. Wilson, of West Meath, described his

method of determining the heat radiation from the nucleus of a sun spot.—*London Times*.

#### GENERAL.

PRESIDENT CLEVELAND has extended the Civil Service Rules in the Department of Agriculture so as to include all officers and employees, excepting the Secretary and the Assistant Secretary of Agriculture and their private secretaries, the Chief of the Weather Bureau and his private secretary, the chief clerk of the department, and the laborers and charwomen.

IN congregation at Oxford a new statute has been promulgated, adding anthropology to the list of subjects in the Honor School of Natural Science.

A MEMORIAL tablet to John Couch Adams, the Cambridge astronomer and mathematician, was unveiled in Westminster on May 9th.

THE province of Ontario is to have a great reservation for the preservation of its animals and plants. The Algonquin Natural Park will comprise about a million acres of forest land. No hunting, trapping or destruction of animal life will be allowed within its precincts.—*American Naturalist*.

IT is announced that the sum of \$250,000 or more has been given to the University of the City of New York for the purpose of erecting a central building on University Heights to contain the library, commencement hall, museum, and offices of administration. In accordance with the wish of the donor the name is not announced.

MAJ. J. W. POWELL is announced as lecturer on the 'History of Culture,' and Prof. Otis T. Mason as lecturer on the 'Origin of Culture,' in Columbian University.

ACCORDING to the accounts of Oxford University for 1894, recently presented to convocation, the revenue amounted to £63,760 and the payments to £64,390.

SIR GEORGE BUCHANAN, M. D., F. R. S., died on May 3d, at the age of 64. He was one of the first medical officers of health in London, having been appointed to St. Giles's in 1856. He originated methods of inquiry in sanitary matters not before attempted, working at the relation of overcrowding and other insanitary conditions of disease, at the prevention of smallpox, typhus fever, cholera and consumption, and originating a system of collecting statistical information of the public health of the district. He was chairman of The Royal Commission on Tuberculosis, which reported shortly before his death.

THE death is announced of Mr. Arthur Edward Durham, a member of the Council and late vice-president of the Royal College of Surgeons, of England. He was the author of *Sleeping and Dreaming* and *The Physiology of Sleep*.

FRANCIS P. HARPER announces *The Expeditions of Zebulon Montgomery Pike* to the headwaters of the Mississippi River, the interior parts of Louisiana, Mexico and Texas, in the years 1805-6-7, reprinted in full from the original Philadelphia edition of 1810, with full explanatory, geographical and scientific notes to the text, compiled from many unpublished sources of information and including the results of a canoe voyage of the editor to the sources of the Mississippi River, a new memoir of Pike and an index to the whole by Dr. Elliott Coues.

AN Austrian expedition for polar research under the direction of M. Julius von Payer will start for Greenland in June, 1896.

AT the recent meeting of the Boston Scientific Society it was stated that Dr. Percival Lowell would observe the opposition of Mars in December, 1896, from a suitable location, not yet decided on. For this purpose a telescope of twenty-four inches' aperture has been ordered.

THE Spectacle Makers' Company recently presented Mr. W. H. M. Christie, Astronomer Royal of England, with its honorary freedom. The Master, in opening the ceremony, said that the spectacle makers claimed to be identified with those trades which, by the instruments they made, notably telescopes, microscopes, compasses, &c., enabled astronomers to pursue their studies and researches. In his reply, the Astronomer Royal said he could not but acknowledge what had been done for astronomy by opticians. It was true that a great deal was done by the early astronomers with very inefficient means. He might particularly mention Tycho Brahe, who, coming after the Greek, Chaldean and Jewish astronomers, besides others, had made great advances without the aid of the telescope. Astronomy and astrology continued to be one science up to the time when the telescope was invented.—*London Times*.

DR. MORRIS HENRY, a well known surgeon, died recently in New York at the age of seventy. He was the founder and editor of the *American Journal of Dermatology*.

THE May *Forum* contains an interesting article by Professor R. H. Thurston on *Our Debt to Inventors—Shall We Discharge Them?* Professor Thurston says: "The promotion of the arts and manufactures by suitably rewarding inventors and providing that they shall be permitted to collect profits, as in all other departments of business, as large as the business will yield, and in due proportion to the value to the country of the invention or discovery, is one of the most important features of an enlightened public policy; and it is the duty of every intelligent and patriotic citizen, and especially of every one in any manner connected with any department of engineering, of manufactures, or of the mechanic arts, to exert every power and to apply all his influence to promote the perfecting of the

patent system, to increase the facilities of the Patent Office, and, especially, to insure the inventor of new and valuable devices a liberal period of possession of the products of his genius."

THE Microscopical Society of Washington held recently its annual exhibition. A large number of microscopical specimens and microscopes were exhibited.

PROFESSOR O. C. WHITMAN was announced to lecture on *The Utilities of Biology* at Mount Holyoke College on May 28th.

In the Massachusetts Institute of Technology four instructors have been made assistant professors—Frederick S. Woods, Ph. D., in mathematics; Theodore Hough, Ph. D., in biology; Williom Z. Ripley, Ph. D., in sociology, and Richard W. Lodge in mining engineering. Samuel P. Milliken, Ph. D., was made instructor in organic chemistry, in place of Dr. Evans, resigned. The following assistants were raised to the position of instructors—W. Felton Brown, free-hand drawing; Simeon C. Keith, Jr., S. B., biology; Ervin Kenison, S. B., mechanical drawing; Frederick H. Keyes, S. B., mechanical engineering; Charles L. Norton, S. B., physics; Kilburn S. Sweet, S. B., civil engineering.

THE following instructors in the Sheffield Scientific School of Yale University have been made assistant professors: S. E. Barney, Jr., civil engineering; Dr. F. E. Beach, physics; Dr. W. A. Setchell, botany; Dr. Percy F. Smith, mathematics.

DR. O. S. STRONG has been appointed tutor in comparative neurology, and Dr. Hermann S. Davis assistant in astronomy, in Columbia College.

W. S. MATTHEW has been made assistant in the American Museum of Natural History.

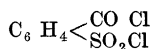
It is reported by telegraph from Naples that Mt. Vesuvius is in an unusually active state of eruption.

It is stated that S. A. Andée's plan for reaching the North Pole by balloon under the auspices of the Royal Swedish Academy of Science will be assisted by a subscription of 30,000 kroners by King Oscar.

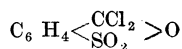
#### SCIENTIFIC JOURNALS.

THE AMERICAN CHEMICAL JOURNAL FOR MAY.

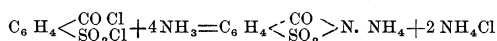
THE principal articles in this number are those containing reports of the investigations carried on by Remsen and others, on the chlorides of orthosulphobenzoic acid. Early in the investigation it was found that when the chloride was treated with aniline two products were obtained, which were most easily explained on the hypothesis that the chloride is a mixture of two isomeric chlorides corresponding to those of phthalic acid. This was afterwards shown to be the fact. Two chlorides were isolated and studied, and the results led to the conclusion that the so-called higher-melting chloride (melting point  $76^\circ$ ) is the symmetrical one, having the formula



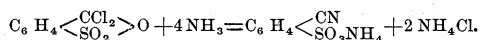
and the other, the lower-melting chloride (melting point  $21.5^\circ$ – $22.5^\circ$ ), the unsymmetrical one, with the probable structure



Both chlorides give ordinary orthosulphobenzoic acid when treated with water, but act differently when treated with ammonia, the symmetrical one forming benzoic sulphinide thus:

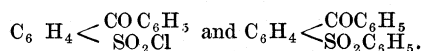


while the unsymmetrical one forms the ammonium salt of orthocyanbenzenesulphonic acid,

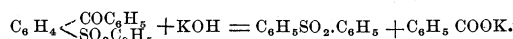


As the unsymmetrical chloride is acted upon much more readily than the symmetrical one, it is only necessary to treat the mixture,

under certain conditions, with ammonia, to obtain the symmetrical one in pure condition. The action of benzene and aluminum chloride, on the mixture or on the pure symmetrical chloride, leads to the formation of two products,



The latter breaks down when treated with potassium hydroxide, yielding diphenylsulphone and benzoic acid:



Besides these articles there are several shorter ones, one by Stone and Lotz showing the identity of the sugar called Agavose, with Sucrose, and one by Trevor on 'The Law of Mass Action.' Chase Palmer gives the results of an investigation of the chromates of thorium, and Cushman describes a method of separating copper and cadmium, which is more satisfactory than the method depending upon the precipitation of the cadmium in presence of the copper. He finds that cadmium sulphide is easily soluble in warm dilute hydrochloric acid in the presence of an excess of alkaline chlorides, and is easily precipitated, after filtering to remove the copper sulphide, which is unacted upon. There are also two very interesting reviews, by Professor Mallet, of the Reports on Chemical Industry at the World's Fair, prepared by the German and French chemical representatives.

J. ELLIOTT GILPIN.

#### THE BOTANICAL GAZETTE.

Issued May 18, 1895. 48 pp., 2 pl.

*The Development of Botany in Germany during the Nineteenth Century:* EDUARD STRASBURGER.

Professor Strasburger wrote an account of the progress of botany in Germany during the present century for the sumptuous work, *Die Deutschen Universitäten*, prepared under the direction of the imperial government for the educational department of the